

1985 Annual Report

ALBERTA TREE NURSERY & HORTICULTURE CENTRE



R. R. #6, EDMONTON, ALBERTA, CANADA T5B 4K3

TELEPHONE: (403) 973-3351

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INTRODUCTION

The Alberta Tree Nursery and Horticulture Centre had an excellent year in 1984/85. Field and container stock performed well under somewhat adverse conditions. For the first time, we have several hundred thousand plants in surplus. Several production changes are being considered to reduce the surplus. Reducing the field time for some varieties is necessary.

The cutbacks in field and turf research were major program concerns; two permanent positions were lost to budget cutbacks. The turf trials were given a minor level of maintenance. As well, the field trials remaining were maintained with no new ones started.

The financial operations of the Centre have remained relatively constant for the 1985/86 budget year with only minor reductions.

The tissue culture centre has done some excellent work on saskatoons and black cherry. Mr. Kris Pruski has finished his masters project with only some loose ends to tidy up. This new venture with the University of Alberta has worked out very well. It is hoped that we can continue such co-operative ventures in the future.

The Greenhouse Specialist came on staff in February, 1985, completing the greenhouse task force recommendation that an extension specialist be placed in northern Alberta.

Trade and industry contacts were quite numerous by all Centre staff. The nursery visits were started and, I trust, were beneficial. Each of the production specialists had production tours in 1985 to the benefit of producers, wholesalers and consumers. The three "Production Notes" newsletters received favourable comments and seemed to provide the kind of information required.

George Grainger
Director

ALBERTA TREE NURSERY AND HORTICULTURE CENTRE STAFF - 1985

George Grainger, P.Ag. Director
 Patricia Fowler Office Manager
 Michele Dannish Secretary
 Vicki Noel Courier

Phil Dixon P.Ag. Vegetable Specialist
 Pearl Balbar Vegetable Technician

Betty Vladicka, P.Ag. Horticulture Extension Specialist

Mirza Mohyuddin Greenhouse Specialist
 Alena Straka Tissue Culture & Greenhouse Tech.

Herman Oosterhuis, P.Ag. Shelterbelt Specialist

Brian Breneman (Shelterbelt Production) Technologist III
 Rulie Bok Gardener II
 Pat Elliott Gardener I
 Vera Fialkowski Gardener I

Rodger Baxter (Grounds & Arboretum) Gardener II
 Sophie Cardinal Gardener I
 Henry Brown Gardener I

Cecilia McIsaac (Containers & Prov. Parks) Technologist III
 Joan Sumka Gardener II
 Thean Pheh Gardener I

Doreen Koladich (Seeds/Orchards) Gardener II
 Nancy Moroz Gardener I

Lydia Erickson (Warehouse) Ag. Officer III

Douglas Lehman (Chemicals & Seeding) Gardener II
 Kevin Thorpe Gardener I

Albert Faulkner (Farm Services) Gardener IV

Dave Wearmouth (Farm Maintenance) Gardener III
 Cyril Cooreman Gardener II
 Kevin Thorpe Gardener I
 Bruce Chedzoy Gardener I

Paul Gervais (Machine Maintenance) M.S.W. III
 Gerry Dames M.S.W. II
 Brian Petherbridge M.S.W. I

David S. Milne (Irrigation) M.S.W. II

STAFF CHANGES IN 1985

There were a few staff changes in 1985. In February, Dr. Mirza Mohyuddin joined our staff as Greenhouse Specialist.

Lorraine Taylor and Frank Straka were employed at the Centre until March 31, 1985 when their positions were terminated as a result of program abolishments.

Warren Barker resigned on April 30, 1985. Douglas Lehman was transferred into his position. In August, Kevin Thorpe filled the Gardener position.

SITE CHANGES AND IMPROVEMENTS

Projects completed or well underway by December 31, 1985 were as follows:

1. Greenhouse #12, the Trial Greenhouse, was put into operation in September 1985.
2. Phase I of the nursery drainage program was completed and has improved some field drainage problems.
3. Lathhouse #7 was half completed by year end. This lathhouse will hold two and five gallon pots on a smooth asphalt surface.
4. Lathhouse #4 was not completed as problems were encountered with the water supply.
5. The Administration Building was well on the way to completion by year end. Occupancy should be by March 1986. The contractor was very efficient and maintained an excellent level of work.
6. The warehouse addition (soil drying and offices), peat/vermiculite storage and equipment shed were started in October. The contractor had major problems, one of which was extremely cold temperatures.

ALBERTA TREE NURSERY AND HORTICULTURE CENTRE ADVISORY COMMITTEE

Those present at our December 2, 1985 meeting were as follows:

Garry Johnson **	Dr. J. Wiebe ***
Mike Lastiwka **	Tom Krahn **
Joe Supino **	Brendan Casement **
Jim Tevelde **	George Grainger **
Joe Doef **	Phil Dixon **
Nigel Bowles **	Betty Vladicka **
Marilyn McArthur **	Mirza Mohyuddin **
Jim Howard **	Herman Oosterhuis **
Patricia Fowler (acted as Secretary)	

** Members of the committee

*** Ex-Officio member of committee

Some notes of interest from the meeting follow:

- a. Wallace Collection - 18 varieties were added to the collection with more expected in the spring. They are planted in field 23 with the Simonet Collection.
- b. A greater public awareness of horticulture must be created. The industry is attempting to create this awareness through advertising, displays at home and garden shows, posters of colored plant material to be distributed through retail stores, etc.

Perhaps the industry should form a study group to determine the value of horticulture in Alberta to be presented to government along with direction on what the industry needs.

- c. Marketing projects have centered in the Edmonton area because of the time limitations in getting the product to market. While it was felt that this type of endeavor is better done by private enterprise, there is no one else to do it at the present time. It offers an excellent opportunity for the vegetable specialist to learn first hand so that he is better equipped to advise growers on all aspects of marketing.
- d. Industry would like to see more nursery visits by specialist and prefer visits to farms. While a request for a visit would be acted upon, it was felt that problems may exist that growers are not aware of unless a visit is made by a specialist. The industry is concerned with keeping stock disease free.

Regional Woody Plant Test Plots - If plants are not taken care of according to the terms of reference, LANTA should be aware of it. It was the association that got it going, and they are very concerned about the program. An evaluation of the test sites and the program as a whole is to be done and forwarded to LANTA.

- e. Thrips predator research will be carried out by Applied Biomix. Funding will be available from Alberta Agriculture (\$5,000), Alberta Environment (\$5,000) and AGGA (\$1,000).
- f. Radio interviews were regularly taped for Call of the Land; a ten minute broadcast produced by the department. Staff were also involved with many radio and T.V. interviews throughout the province.
- g. The Centre continues to conduct its winter education program through the offices of the D.A.s and D.H.E.s. At least three courses are offered in each of the six regions. This coming winter topics include: pest management, yard maintenance, greenhouse construction and management, home orchards, vegetable gardening and grafting. In addition to these day long courses, shorter presentations are given to service clubs, horticultural societies, etc.

- h. In August, 85 people were involved in a vegetable growers tour and represented approximately 35 farms. Three farms, plus research plots in production and insect control were visited.
- i. The Alberta Horticultural Research Center at Brooks and the Alberta Tree Nursery and Horticulture Centre in Edmonton decided, during the spring of 1985, to serve tree nurseries throughout Alberta with an on site visit, provided those nurseries expressed in writing such a need.
- j. In contacts with these nurseries, there was not one item which can be singled out as the most pressing problem of nursery operators in central Alberta. It is apparent that newly starting nurseries are more aggressive (i.e., more competitive) in securing a large contract as is offered by Alberta Agriculture for planting stock needs of the shelterbelt program.
- k. A modest greenhouse research and demonstration program was started. NFT systems were designed for growing lettuce and tomatoes. A winter tomato production trial was initiated. In tissue culture, work was continued with saskatoons. Good results were obtained with root initiation. Work is in progress on strawberries and gerberas.

COMMITTEE AND ASSOCIATION AFFILIATION OF STAFF

- Alberta Horticultural Association (AHA)
- numerous horticultural and agricultural societies
- The University of Alberta Devonian Botanic Garden (DBG)
- Parks and Recreation departments
- Western Canadian Society for Horticulture
- Northern Forest Research Centre
- University of Alberta
- Olds College
- Fairview College
- Landscape Alberta Nursery Trades Association
- Alberta Greenhouse Growers Association
- Alberta Interior Plantscapes Association
- Bedding Plants Inc. (BPI) ... A Growers Organization
- Saskatchewan Horticultural Association
- Agricultural Service Boards
- International Society of Arboriculture
- Intermountain Nurserymen Association
- Trustees of the Friends of the DBG
- Horticulture Extension and Education Committee
- Horticulture History Committee
- BPI Convention Committee
- The Environmental Horticulture Advisory Committee
- Alberta Horticultural Advisory Committee
- Alberta Nursery Growers Group
- Landscape Alberta Retail Operators Association
- Saskatchewan Turfgrass Association
- AHRC Advisory Committee

- ATN & HC Advisory Committee
- Edmonton Fresh Vegetable Growers Co-op
- Alberta Fresh Vegetable Marketing Board
- Alberta Farmers Market Advisory Committee
- Alberta Market Garden Association
- Alberta Vegetable Advisory Committee

METEOROLOGICAL REPORT

TABLE I

MAXIMUM, MINIMUM AND MEAN TEMPERATURES AT ALBERTA TREE NURSERY
AND HORTICULTURE CENTRE
1985

MONTH	MAXIMUM MEAN °C	MINIMUM MEAN °C	MEAN °C	EXTREME HIGH	EXTREME LOW
January	- 3.9	-14.6	- 9.3	8.0	-35.0
February	- 6.5	-18.0	-12.2	10.0	-36.5
March	4.2	- 5.8	- 0.6	13.5	-22.0
April	10.5	- 0.95	4.8	19.5	- 6.0
May	19.6	5.1	12.4	28.5	- 2.0
June	19.8	6.4	13.1	26.0	- 0.5
July	24.5	10.1	17.3	30.5	1.0
August	20.5	8.1	14.3	30.5	1.0
September	13.5	3.0	8.25	19.5	- 6.5
October	8.8	- 1.1	3.9	17.0	- 9.0
November	- 9.2	-17.6	-13.4	7.5	-34.5
December	0.0	-11.0	- 5.5	11.5	-31.5
AVERAGE	8.5	- 3.0	2.75	30.5	-36.5

TABLE II
PRECIPITATION IN 1985

MONTH	RAINFALL (MM)	SNOWFALL (CM)	TOTAL (MM)
January	6.2	7.4	13.6
February	2.8	10.9	13.7
March	0	1.2	1.2
April	8.8	38.6	47.4
May	40.9	tr	40.9
June	84.3	-	84.3
July	52.5	-	52.5
August	77.4	-	77.4
September	55.8	tr	55.8
October	29.0	3.2	32.2
November	-	7.2	7.2
December	7.0	25.8	32.8
TOTAL	364.7	94.3	459.0

First and last killing frost dates (-2.0°C) May 6 - September 23
139 days

MONTHLY DISTRIBUTION OF TELEPHONE INQUIRIES & SOIL REPORTS OF
EXTENSION STAFF - 1985

TABLE III

MONTH	NUMBER OF TELEPHONE INQUIRIES	HORT LINE	NUMBER OF SOIL REPORT RECOMMENDATIONS
January	175	135	46
February	175	127	58
March	482	199	101
April	847	198	155
May	1,602	331	217
June	1,114	261	140
July	1,102	223	64
August	899	190	104
September	722	164	86
October	533	207	209
November	231	157	22
December	159	131	38
TOTALS	8,041	2,323	1,240

HORTICULTURE EXTENSION PROGRAM

Horticulture extension is responsible for the development of non-commercial horticulture in the province. The primary objective is to encourage a greater interest in horticulture and to provide information to the public.

Horticultural information was provided through a variety of methods and channels. A bi-monthly newsletter, Nursery Notes, was produced for those in the nursery trades. It provided current information on nursery management, sod production and maintenance of turf and woody ornamentals. The newsletter Horticulture Extension Notes (HEN), was produced to facilitate communication among those involved in urban horticulture extension. HEN attempts to broaden the extension skills of these individuals and keep them up to date with the research at the Alberta Tree Nursery and Horticulture Centre and the Alberta Horticultural Research Center. Regular submissions were produced for Agri-News. Assistance was provided in the production of the new publication 'Backyard Pest Management' and the revision of the 'Alberta Horticultural Guide' and 'Hobby Greenhouses in Alberta'.

Over 40 interviews were taped for Alberta Agriculture's radio program, Call of the Land. The extension horticulturist participated in three phone-in talk shows for CKRA, Edmonton, two interviews for CJCY, Medicine Hat and one television interview for CFRN, Edmonton.

Horticultural information was also provided to the public through two different telephone services. Horticulture extension operated a horticulture hot-line which consisted of taped messages that were changed semi-weekly. The hot-line received 2,323 calls in 1985. Staff also handled over 6,600 telephone inquiries. The 1985 figures were 14% greater than the previous year and the number of inquiries continues to increase. A basic diagnostic service was also provided. Staff examined approximately 100 plant samples. Many of the inquiries were about winter injury of ornamentals that was severe throughout most of the province and control of various insect pests.

Publications are another means used by horticulture extension staff to provide information. In addition to those provided to the general public, this office was responsible for the bulk distribution of the Horticultural Guide and Backyard Pest Management to Landscape Alberta Nursery Trades Association members. In total, over 113,000 publications were distributed.

Horticulture extension staff continued to conduct the winter education program through the offices of the district agriculturist and district home economists. The extension horticulturist planned and co-ordinated this program which offered three courses in each of the six regions in the province. Staff at the Alberta Tree Nursery and Horticulture Centre and the Alberta Horticultural Research Center assisted in conducting these day long courses that included the topics

of landscaping, yard maintenance, vegetable gardening, grafting, and backyard orchards. In conjunction with one of the vegetable gardening courses, a tour of three farm gardens in the Athabasca area was held during July. Classes were also held for further education councils, agricultural and horticultural societies.

This office received numerous requests for shorter presentations at rural women's conferences, and meetings of horticultural societies and other community service clubs. In 1985, nine such presentations were given.

Displays were produced for the annual Field Day at AHRC, the bench show of the Stony Plain Horticultural Society and the annual convention of Landscape Alberta Nursery Trades Association.

Horticulture extension provided the recommendations for all the soil tests for home gardens and turfed areas that were tested by the Alberta Soil and Feed Testing Laboratory. 696 reports were completed in 1985.

This office serves as a liaison between Alberta Agriculture and several organizations across the province. The extension horticulturist is an ex-officio member of the Trustees of the University of Alberta Devonian Botanic Garden and the Board of Directors of the Alberta Horticultural Association (AHA). In addition to the five AHA board meetings, eight committee meetings were attended. Assistance was provided in planning the Association's two major functions, the provincial show held in Lethbridge and the annual convention held in Medicine Hat. The extension horticulturist served as the co-ordinator for the AHA's education program, and editor of the organization's publications: the quarterly bulletin The Alberta Horticulturist, the newsletter Hort Happenings and the annual report.

Two new horticultural organizations were founded in 1985, the Alberta Regional Lily Society and the Alberta Interior Plantscapes Association. Assistance in organizing was provided to both groups.

The Alberta greenhouse growers are hosting an International event in 1986, the annual convention and trade show of Bedding Plants Inc. It is expected that this event will attract more than 1000 delegates. The extension horticulturist has been serving as the convention committee secretary.

The Western Canadian Society for Horticulture (WCSH) held its annual conference in Calgary in 1985. In addition to serving as secretary for this organization, the horticulturist was active in organizing this event. The Horticultural History Committee of WCSH has been actively collecting information on the development of horticulture on the prairies since 1956. The extension horticulturist has been active on this committee and is working with the editor on the preparation of the final document.

The horticulturist is the secretary of the Horticulture Extension and Education Advisory Committee and a participant at meetings of the Alberta Horticultural Advisory Committee, Environmental Horticulture Advisory Committee and the ATN & HC Advisory Committee.

This office continued to administer three grant programs. One grant was provided to the Alberta Horticultural Association to assist in the operation of its programs. Another was given to the University of Alberta Devonian Botanic Garden to assist in the maintenance of the gardens. The third program provided grants to urban municipalities to assist them in providing horticulture information to amateur gardeners. The cities of Edmonton, Calgary, Lethbridge and St. Albert received grants under this program.

Horticulture extension continued to assist other areas of the department wherever possible.

Turf Program

The turf program was eliminated on March 31, 1985 as part of the provincial government's commitment to restraint. The abolition of this program brought to an end all turf research and the production of the newsletter Turf Notes.

MARKET GARDEN VEGETABLE PROGRAM

The vegetable program at the Alberta Tree Nursery and Horticulture Centre performs research and extension on production and marketing for all commercial vegetable growers in central-northern Alberta. Staff consists of the Vegetable Crop Extension Specialist, a gardener and a summer technician.

EXTENSION PROGRAM

Teaching commercial growers the proper methods and techniques in production and marketing vegetables is the major task of the program. Extension is designed to offer answers to growers and new concepts determined by our research. The program aims at offering leadership to the industry.

Information on production and marketing is extended to growers by many means. Constant communication to the 300 growers is maintained with the program's newsletter 'Produce Notes'. This monthly newsletter has sections on production, marketing, equipment and upcoming news and events.

Personal communication is by telephone, farm calls, and growers visiting the Centre. With major production in the Peace River Valley (as well as Edmonton) and minor production in Ft. McMurray and Red Deer, travel to these locations occurs every three to four weeks in the summer. While phone calls are higher in the summer than winter (average 150 versus 60 monthly), farmers coming to the Centre and farm calls dip only slightly. The winter months are planning months and provide the best time to extend information. Assisting with the planning of farms is a major winter program.

Tours and seminars lend themselves very well to the education process. Two tours were held with the major one in August attracting 85 growers. Three farms and the programs research plots were highlighted. A growers barbecue and a visit to the research plots attracted 75 growers. Education Market Garden Short Courses were held in Bonnyville (20 growers) and Edmonton (60 growers). A marketing seminar in November attracted 25 growers to discuss the successes and problems of 1985.

Marketing extension has provided the greatest success in achieving increased acreage. Marketing commercial vegetable crops is through farm gate, farmers markets and wholesale outlets.

Buyers from wholesale companies are welcomed into the program the same as growers are. A tour of farms in August for buyers created instant sales. Most of the needs of buyers and growers are solved by increasing communication between the two. Buyers are kept in constant contact all spring, summer and fall. If they have problems finding produce, growers are directed to them. This has worked so

successfully that one large wholesaler has begun to enter into handshake agreements for produce in 1986, an almost unheard of occurrence in this industry. Buyers are invited to all our courses and events, in an attempt to make them feel a part of the Alberta Industry.

The 'Edmonton Fresh Vegetable Growers Co-op' was formed by ten experienced growers in May 1985, with the program's full support and assistance. Pickling cucumbers were marketed successfully to Edmonton wholesalers. Acreage was increased by growers to fill this market.

The program ran the Mill Woods Farmers Market to gain experience in running a market and to try new marketing techniques, both reasons to pass information over to growers to help them increase sales.

RESEARCH AND FARM DEMONSTRATIONS

Research backs up the extension program. Research is aimed at filling in gaps in the systems of commercial vegetable production. The use of farm demonstrations moves the research to the grower in the quickest possible method. The program looks for earliness and for quality, the two main ingredients which allow growers to make a profit.

Research

A brief review of 1985 research at the Alberta Tree Nursery and Horticulture Centre:

1. Chinese Cabbage Cultivar Trial: Chinese cabbage is becoming a popular selling vegetable at Alberta farmers markets as growers attempt to fill in specific consumer markets. Presently growers are wholesaling Chinese cabbage throughout Alberta and Saskatchewan. Growers can produce high quality Chinese cabbage. Knowledge of various cultivars is needed to keep acre production and quality increasing.

Fifteen cultivars were direct seeded on July 2, 1985. The late date was selected due to the problems of bolting (going to seed) when planted earlier. Cultivars grown were: Zephyr, Arcadia, Magica, Springtime, Jade, Pagoda, China Pride, Summertime, Monument, Hong Kong, Nagoaka 50, WR 60, Granada, Wintertime, Nagoaka 60 and Nagoaka King. Data on days to first harvest, average head weight, average head size, core length, membrane size and inner color were taken. Zephyr was harvested at 64 days while all others harvested at 67 days, except for Wintertime, Nagoaka 60 and Nagoaka King which harvested at 79 days. Arcadia had the heaviest head for the early cultivars while Wintertime had the heaviest head for the entire trial.

2. Cauliflower Cultivar Trial: Cauliflower is a cool season crop with good potential for acreage increase in Alberta. Due to this potential, cauliflower has taken a prominent place in trials.

Nine cultivars of cauliflower were direct seeded on May 17, 1985. The cultivars were: White Top, White Rock, Andes, Cervina, Snow Pak, Vernon, White Summer, Taipan and White Fox. Cultivar selection for a grower is very important due to the marketing of only pure white curds. Evaluation is based on leaf cover, whiteness of curd, yield, days to harvest and the spreading out of harvest. A production schedule of Andes for earliness with White Fox and White Rock for main harvest was determined for growers. All three had marketable curds when properly managed.

3. Green Cabbage Cultivar Trial: Green cabbage is one of the most important vegetable crops grown in Alberta. Evaluations of early and mid-season cultivars allows growers to take advantage of the summer market. Eighteen cabbage cultivars were direct seeded on May 17, 1985. Cultivars tested were: Earlianna, Emerald Acre, Delphi, Early Greenball, Early Marvel, Tucana, Headstart, Princess, Stokes Viking Golden Acre, Copenhagen Market Early, Conquest, Supermarket, Stonehead, Marketprize, Gourmet, Blue Boy, Bravo and Blue Crown. Evaluation is based on ability to hold and not split at maturity, first harvest date, number of harvests, date to 75% harvest, average head weight, average head size and average core length. First harvest for the earliest cultivars occurred at 74 days (Earlianna, Emerald Acre, Delphi, Early Greenball, Early Marvel, Tucana). Their head weight (approximately 2.5-3 lbs) and proneness to splitting made them unattractive for the wholesale trade. The earliest cultivars with sufficient weight of approximately 5 lbs and the ability to withstand splitting were Headstart and Princess (first harvest at 79 days). All cultivars except the first six averaged approximately 5 lb head weight.
4. Sweet Corn Cultivar Trial: Sweet corn is a high value crop in central-northern Alberta. It is sold directly to the consumer at the farm gate and farmers markets.

Fifteen sweet corn cultivars were direct seeded on May 14, 1985. Evaluation was based on corn heat units (CHU) to first harvest (and days to first harvest), marketable yield, tip fill, average ear length, average plant height, flag leaf coverage and kernel color. Cultivars tested with their respective CHU to first harvest in brackets were: Earlivee (1809), Early Arctic (1809), Northern Vee (1809), Seneca 60 (1936), Seneca Horizon (1936), Sunny Vee (1936), Buttervee (1936), Alta Gold (1936), Early Bird (1936), Golden Beauty (2024), Seneca Star (2024), Earligem (2024), Spirit (2024), Spring Gold (2024) and Jazz (2024).

Corn heat units from May 1 to August 31 totaled 1918.8. The sales of sweet corn are highest in August, therefore, cultivars with over 1950 CHU may make maturity in September, they miss out on the peak August sales. Sunny Vee had the highest yield (23.34 t/ha) and second longest cob (21 cm). Northern Vee had the highest yield (17.72 t/ha) among the early cultivars.

5. Pickling Cucumber Cultivar Trial: Pickling cucumbers are a major income crop for commercial growers. With sales mainly at the farm gate and farmers market in the past, we are now seeing the crop make it to the wholesaler and then the retailer. This crop is a priority in the program.

Eleven cultivars were direct seeded on May 22, 1985. Cultivars evaluated were: Earlipik, Target, Calypso, County Fair, Lucky Strike, Tempo, Commander, Calico, Sentry, Pioneer and Pennant. Evaluation is based on days and degree days to first harvest, yield at first harvest and total yield, a breakdown of total yield into graded yield (five grades based on size), shape, color and a length/diameter ratio. All cultivars (except Pennant at 83) had first harvest at 74 days (212 degree days). Lucky Strike had the highest first yield while Tempo and Target had the highest total yield. Best cultivars for uniform shape and marketability were Earlipik and Calico.

6. Succession Seeding of Lettuce Types Trial: Lettuce is sold at the direct to consumer outlets of the farm gate and farmers markets. Problems with continuity of supply exist. The purpose of the trial was to study succession seeding of lettuce as a part of a growers production system.

Three lettuce cultivars representing three different types of lettuce were seeded in succession of approximately two week intervals. Seeding dates were May 1, 16, June 3, 14, July 2, 15 and 31, 1985. Cultivars used were: Great Lakes (head lettuce), Buttercrunch (butterhead lettuce) and Parris Island Cos (cos or romaine lettuce).

The last three seeding dates of July 2, 17 and 31 did not produce a mature marketable crop. Days to 50% seedling emergence took approximately six days for the last four seeding dates. Great Lakes head lettuce required 80, 90, 73 and 76 days respectively for the first four seeding dates to first harvest. Buttercrunch butterhead lettuce required 66, 79, 73 and 68 days to first harvest while Parris Island Cos cos lettuce required 73, 79, 73 and 68 days.

7. Sweet Corn Earliness Trial: Sweet corn is a major income crop with sales at direct to consumer outlets. Early crops demand higher prices.

The cultivar Buttervee was seeded May 1 into five treatments of bare soil (bs), black mulch (bm), black mulch and tunnel (bmt), clear mulch (cm) and clear mulch and tunnel (cmt). Corn heat units were determined not taking into account the plastic. Buttervee required 1809 CHU to first harvest on bare soil, 1743 with bm; 1628 with cm, 1544 with bmt and 1471 with cmt. There is no significant difference in days to first harvest between bmt and cmt. While plastic did increase earliness, it also affected yield. Bare soil had the highest total yield, although not significantly different than bmt and cmt. Black mulch had significantly lower yield and lower total number of ears than the other treatments.

Recommendations must be made in accordance with economics. Approximately 20 CHU are accumulated daily, therefore, clear mulch gains approximately nine days and cmt approximately 17 days. Black mulch without tunnel is not recommended.

Farm Demonstrations

1. Lettuce and spinach fall seeding - Ft. McMurray
2. Sweet corn cultivars - Edmonton, Fairview and Ft. McMurray
3. Pickling cucumbers mulch and tunnel - Beaverlodge, Edmonton, Rocky Mountain House and Edson
4. Cabbage cultivars - Berwyn and Edmonton
5. Pea cultivars - Rocky Mountain House and Edson
6. Cauliflower cultivars - Edmonton (two)
7. Pickling cucumber cultivars - Edmonton and Fairview
8. Hot caps - Lac La Biche
9. Carrot fertility - Morinville

Programs

Inspections were made at 51 farms for the Market Garden Development Grant program. Numerous ADC loan proposals were evaluated.

GREENHOUSE EXTENSION PROGRAM

COMMODITY REVIEW

1985 was a year of instability for the greenhouse vegetable industry. Tomato growers were seriously hurt by cheaper imports and unwillingness of wholesalers to pay for the quality. If cheaper imports continued unrestricted, there won't be any greenhouse tomato growers in next two to three years. Greenhouse cucumber growers faced a severe competition from Ontario and the average price of seedless cucumbers was lower than in 1984. Western flower thrips caused serious losses to the cucumber growers.

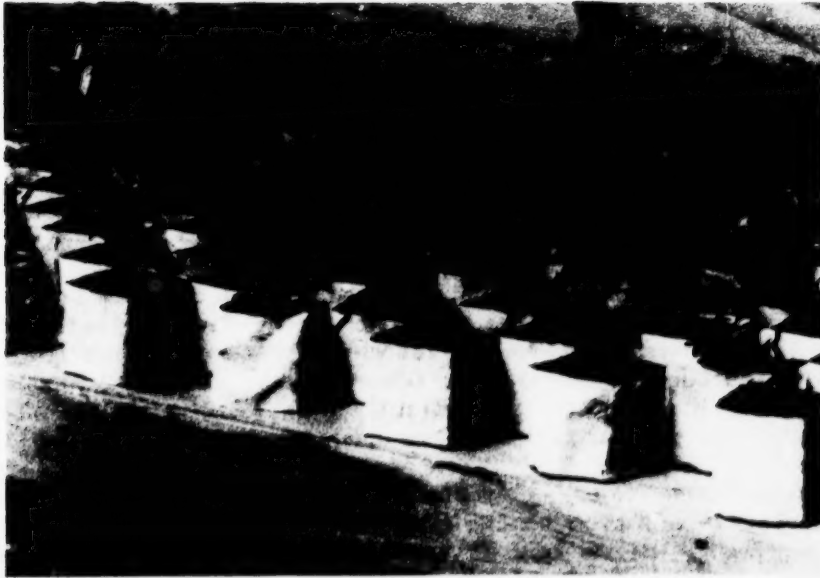
The greenhouse industry also faced serious competition from B.C. growers. British Columbia and Ontario have energy conservation and higher productivity incentives in place, an advantage which Alberta growers did not enjoy.

The greenhouse area in Redcliff-Medicine Hat increased. Approximately another 15,000 m² area was added, mainly using double plastic. One grower started growing crops in rockwool.

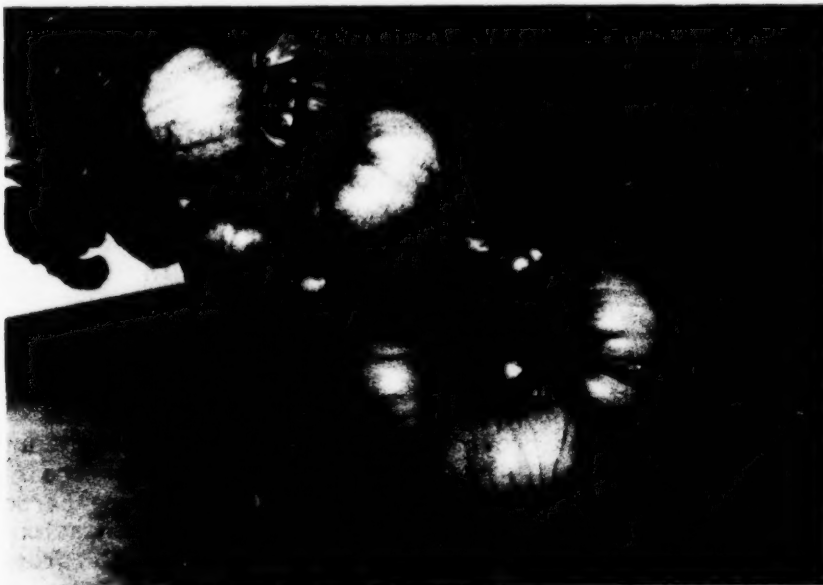
Bedding plants and ornamentals production area remained stable. Growers enjoyed a good year. Cropping patterns were changed by many growers to accommodate marketing realities. For example, growers reduced area on cut flowers and devoted that area to potted plants. Most successful growers were those who had their own retailing facilities.

The Alberta Greenhouse Grower's Association continued to grow during 1985. Their third annual convention in Calgary attracted 275 participants. They held several subject workshops over the province. The Interior Landscaper's Association decided to join Landscape and Nursery trade association. There are some opportunities for greenhouse growers to produce foliage material for interior landscapers.

Alberta Agriculture continued to provide extensive backup to greenhouse growers. A staff position of greenhouse extension specialist was created to cover central and northern Alberta. The Alberta Agriculture's soil and feed testing laboratory continued to play an important role in providing quick analyses. Alberta Agriculture provided \$5000 to mass rear a predatory mite for thrips control to Applied Bionomics Ltd. of B.C.



TOMATO SEEDLINGS GROWN IN ROCKWOOL



LARGE FRUITED TOMATO CULTIVAR 'LAURA' IN GREENHOUSE

GREENHOUSE EXTENSION AND RESEARCH

The greenhouse extension position at the Alberta Tree Nursery and Horticulture Centre was started on February 1, 1985. The main function was to provide support to growers in central and northern Alberta. Individual grower visits ranged between 30 to 40 per month and visited growers in southern Alberta along with Mr. Gordon Grant, located at AHRC, Brooks.

Making soil test recommendations occupied a good deal of time. They ranged between 20 to 30 reports per month. The number of soil samples taken by Interior-landscape organizations increased considerably. The Alberta Agriculture Soil and Feed Testing Laboratory provided a very efficient service to the growers. Greenhouse samples received priority and the turn around time has been around one week.

Alberta Greenhouse Notes continued to be an important tool for disseminating information to the growers. Its circulation is to more than 500 growers in and out of the province. The column format is enjoyed by the growers.

Participation in the Alberta Greenhouse Grower's Association increased during 1985. Attended four board of directors meetings. Produced three newsletter for the Association. Organized and participated in a poinsettia tour in which growers and wholesalers participated. Contributed talks in five AGGA sponsored workshops and the 3rd Annual AGGA Convention in Calgary. Active co-operation and participation continued with the greenhouse clinic program at Olds College, Alberta Interiorscapes Association and various horticultural societies.

During 1985, was invited as a guest speaker at three out of province organizations. Gave a talk on "Plant Cultivars and Disease Control in Hydroponics" at the Hydroponics Conference held in Hawaii during February 1985. The conference was organized by the International Centre fo Special Studies. Contributed a talk on "Alberta Greenhouse Vegetable Industry" at the 7th Annual Canadian Greenhouse Conference, Guelph, in November. Gave three talks at the Saskatchewan Greenhouse Grower's Association Convention that was held in Saskatoon in November.

During 1985, recorded six radio programs for Call of the Land program and one T.V. program on hydroponics.

Greenhouse Information was provided to about 120 people who wanted to start a greenhouse business. Evaluated six proposals for the Alberta Agriculture Development Corporation. Acted as a resource person for several government agencies. Greenhouse cucumber recommendations were published and made available to growers. A poinsettia production booklet was produced for the Alberta Greenhouse Grower's Association.

Research

A modest greenhouse research and demonstration program was started. Lettuce cultivars were evaluated into four hydroponic systems. The cultivars were butterhead and Iceberg type. The systems were 1) 10 cm

white eavestroughs, 2) 10 cm diameter grey PVC pipe, 3) plastic grow channels and 4) 15 cm nursery pots with a soilless mix. In the first three systems, nutrient solutions were recycled and seedlings were grown in rockwool. In the fourth system, a drip irrigation system was used. The trial was mainly observational in nature and also served as a demonstration for growers. Out of butterhead cultivars, Bistro and Ostinata gave very good quality heads. Crisp iceberg cultivars did not yield a head comparable to California grown outdoor lettuce. The crop was marketed through farmer's markets with very good acceptability.

Tomato trials using three different nutrient solution conductivities, rockwool chips and soilless media were started in October and the data will be available in 1986.

During 1985, laboratory activities predominantly consisted of tissue culture of saskatoon, black cherry and strawberry species. Saskatoon rooting trials were very encouraging. Final rooting is done in rockwool cubes and we are in a position to supply large quantities to the industry.

Black cherry tissue culture request came from AHRC, Brooks. It was easy to multiply but difficult to root. Finally, after experimentation, an optimum concentration of hormones has been found which would initiate rooting in rockwool block.

Further research would be directed towards the industry needs.

Within the laboratory, almost 500 kg of seed species was prepared to be used for the shelterbelt and container programs. Germination tests on 150 seed lots were also completed.

The joint seed research program undertaken with the Alberta Forest Reclamation Branch was completed and the results will be published. The purpose behind this seed trial program was to investigate specific methodologies required in order to determine the optimal seed propagation on many different tested species.

SHELTERBELT PROGRAM

In the spring of 1985, the following volumes of plant material were shipped out for shelterbelt planting purposes:

<u>TYPE OF SHELTERBELT</u>	<u>NUMBER OF PLANTS</u>
Farmstead Plantings	1,800,000
Roadside Shelterbelts	30,000
Field Shelterbelts	180,000
Acreage Plantings	220,000
Replacements	<u>160,000</u>
TOTAL	2,390,000

This plant material was distributed throughout Alberta (see Table IV).

Table V illustrates the type of species which were produced and distributed in 1985.

Every year the distributed stock is tested for field performance (i.e., 25 or 50 plants selected at random are planted out and survival is counted in September). For the 1985 stock, the overall survival percent was 83.5. Individual storage and survival was as follows:

<u>STORAGE</u>	<u>PLANT TYPE</u>	<u>% SURVIVAL</u>
Headerhouse Cooler	Deciduous bareroot	88
Cooler II	Deciduous bareroot	90
Field 27 ¹	Deciduous bareroot	98
Springlift	Deciduous bareroot	92
Headerhouse Cooler ²	Conifer bareroot	34
Cooler II	Conifer container	95
Springlift	Conifer bareroot	93

TABLE IV
DISTRIBUTION OF SHELTERBELT TREES IN 1985

DISTRICTS	# ORDERS	# TREES	# PARCELS	DATE SHIPPED
Vauxhall	59	15842	214	April 23
Taber	102	26002	360	April 23
Medicine Hat	177	87552	1007	April 23
Warner	83	40428	468	April 23
Vulcan	118	42552	381	April 24
Pincher Creek	59	19937	246	April 24
Cardston	174	72344	1067	April 24
Lethbridge	235	93376	1391	April 25
Foremost	113	36684	328	April 25
Claresholm	191	70810	793	April 25
Brooks	268	88280	1161	April 29
Strathmore	183	63084	696	April 29
High River	136	48706	537	April 29
Oyen	62	40804	277	April 30
Hanna	80	56756	441	April 30
Three Hills	128	45874	414	April 30
Drumheller	76	40622	358	May 1
Olds	149	41195	670	May 1
Calgary	223	108918	1070	May 2
Sedgewick	180	58813	780	May 3
Rimbey	62	10310	204	May 6
Ponoka	75	19438	284	May 6
Stettler	96	41330	341	May 6
Provost	104	25573	442	May 6
Coronation	111	72876	629	May 7
Wetaskiwin	212	52027	917	May 7
Rocky Mtn. House	102	23093	340	May 7
Red Deer	262	61601	1013	May 7
Lacombe	130	37902	687	May 8
Camrose	177	66832	866	May 9
Lloydminster	108	37866	484	May 9
Vermilion	108	30670	490	May 9
Wainwright	103	23128	380	May 9
Bonnyville	121	26615	421	May 9
Vegreville	168	38964	691	May 9
Two Hills	117	23250	473	May 9
Lamont	178	49510	834	May 10
St. Paul	155	27275	456	May 13
Smoky Lake	75	18402	303	May 13
Ryley	116	32405	504	May 13
Lac La Biche	96	19927	314	May 13
Edson	63	13377	219	May 14
Evansburg	54	9195	141	May 14
Drayton Valley	32	4842	79	May 14
Stony Plain	333	70359	1112	May 14
Westlock	112	19233	340	May 14
Thorhild	70	12276	251	May 14
Sangudo	138	31247	423	May 15
Morinville	143	25062	430	May 15
Leduc	112	40901	561	May 15
Edmonton	87	16098	233	May 15
Athabasca	95	24152	389	May 15
Barrhead	106	14392	294	May 15
Eggleham	61	8881	155	May 16
Spirit River	59	9669	161	May 16
High Prairie	93	21563	363	May 16
Valleyview	71	13261	228	May 17
Fahler	90	22518	358	May 21
Peace River	117	37502	392	May 21
Fairview	84	23868	313	May 21
Grande Prairie	280	87259	1236	May 21
Manning	63	9059	123	May 21
Ft. Vermilion	95	43460	418	May 21
TOTALS	7830	2395847	31951	

TABLE V
BREAKDOWN OF TREES SHIPPED BY SPECIES AND CULTIVARS
AND INTENDED USE

SPECIES	FARMSTEAD	HEDGE	FIELD	REPLACE	ACREAGE	PARKS	ARBOR	TOWN	TOTALS
Northwest Poplar	53400	1700	3600	3650	125	0	0	525	63000
Brooks #6 Poplar	168675	2200	12025	16050	8275	750	0	2025	210000
Griffin Poplar	48225	775	2525	3025	50	300	0	1100	56000
Plains Cottonwood									
Poplar	9275	300	1250	1500	25	175	0	200	12725
Laurel Leaf Willow	124175	1500	8775	10050	28050	25	25	2400	175000
Acute Leaf Willow	32600	175	3325	2900	650	25	0	325	40000
Golden Leaf Willow	25475	425	1050	2750	50	0	0	250	30000
Peach Leaf Willow	13175	300	975	1500	150	200	0	300	16600
Manitoba Maple	68175	800	4150	4500	21250	150	75	400	99500
Green Ash	53225	225	1275	4075	15100	25	25	2925	76875
Bur Oak	17050	25	225	1700	175	0	0	200	19375
White Birch	27100	275	875	2075	275	25	0	375	31000
Mayday	67875	500	1275	5025	19500	150	25	1575	95925
Chokecherry	11675	100	1075	1025	75	25	0	25	14000
Russian Olive	14900	175	1400	2125	25	0	0	375	19000
Sea Buckthorn	11925	400	575	975	100	0	0	25	14000
Caragana	521350	11175	73200	52025	72100	800	0	6675	737325
Villosa Lilac	51600	900	600	3300	175	550	0	375	57500
Common Lilac	34800	750	1475	1575	300	0	0	100	39000
Honeysuckle	52950	600	1550	3975	575	0	0	350	60000
Dogwood	47800	200	950	3175	975	0	0	1325	54425
Hedgerose	17600	325	475	875	325	0	0	100	19700
Altaica Rose	2925	25	0	425	0	25	0	0	3400
Silver Buffaloberry	2850	100	75	250	0	0	0	25	3300
Cherry Prinsepia	16825	225	825	1150	275	25	0	175	19500
White Spruce	154220	1360	9080	14020	39050	520	270	1480	220000
Colorado Spruce	112260	640	4530	11000	690	340	60	480	130000
Norway Spruce	5500	10	160	320	10	0	0	0	6000
Lodgepole Pine	24330	170	1030	2480	11580	0	0	410	40000
Scots Pine	8880	10	410	620	80	0	0	0	10000
Siberian Larch	17180	180	1690	1360	200	0	0	390	21000
Conservation Bundle	1433	18	35	179	29	1	0	5	1700
Totals	1819428	26563	140460	159654	220239	4111	480	24915	2395850

Growing Conditions at the Nursery

From fall 1984 to fall 1985 (October 1 to September 30), the nursery grounds received 448 mm of precipitation while 483 mm is the longtime average. During March, no precipitation was recorded, while during September 1985 precipitation was more than 20% above normal, and April 1985 was double the normal amount. Moisture wise, the nursery did not experience deficiency periods. The weather was good for harvesting woody plant material, particularly during the fall of 1985. The early start of the winter in 1984 and the extreme low temperatures in October 1984 (-23°C in October 1984, an all time record) caused problems with woody plants such as willows, siberian elm and junipers. However, the production of shelterbelt planting stock was not affected by the low temperatures; a good snow cover for spruce and pine transplants made such a crop almost immune to damage from winter freezing. However, we experienced different results with the container grown material (containers of 1, 2 and 5 gallon sizes). Certain species, e.g. lodgepole pine, did not appear to be very well adapted to grow in containers which require overwintering without protection. Studies are underway to find a better system for winter storage of pine, juniper and some deciduous plant material.

EXTENSION ACTIVITIES

Shelterbelt extension and woody plant maintenance courses were held at Medicine Hat, Sedgewick, St. Paul, Edmonton, Spirit River, Fairview, High Prairie and Grande Prairie. Support was given to the commercial nursery operators in Alberta and 12 nurseries were visited during the summer months. In March, two 2-day pruning courses were offered with an attendance of 70 people.

NURSERY ACTIVITIES

A permanent staff of seven people were directly involved in the shelterbelt tree production. 6,147 seasonal mandays were used to complete the tasks over the period of April 15 to November 22. The breakdown of seasonal mandays per activity is as follows:

	<u>MANDAYS</u>	<u>% OF TOTAL</u>
Shipping	737	12
Spring Lifting-grading	326	5.5
Planting Cuttings	200	3
Weeding	1549	25.5
Grounds and Arboretum	503	8
Transplanting Conifers	562	9
Fall Lifting-grading	1599	26
Seeding	54	1
Regional Hardiness Trial	158	2.5
Miscellaneous	459	7.5
	<u>6147</u>	<u>100</u>

Shipping

The assembling of tree orders commenced April 19 and was completed May 17. 2.4 million seedlings were shipped along with 48 Forever A Tree and eight 4-H bundles. 400,000 conifers and willows were lifted prior to and during the shipping operation.

Propagation

Hardwood Cutting Production and Planting: The cuttings were made from early December to March. The production is as follows:

Willows	688,000
Poplars	<u>783,000</u>
Total	1,471,000

They were planted from May 21 to June 5, using three planting machines putting in 150,000 cuttings per day. The fall harvest showed a cutting success rate of 40%, down 23% from last year.

Seeding: Summer seeding of green ash and Manitoba maple was done July 15. Fall seeding was completed early October. The following is the listing of the number of meters sown including summer seeding:

Tall Deciduous	3,004	meters
Small Deciduous	2,153.5	meters
Hedge Plants	5,772	meters
Conservation Bundle	943.5	meters
Coniferous	200	meters
Miscellaneous	<u>192</u>	meters
Total	12,264	meters

Caragana was row seeded July 5, using 94 kg over 3.3 hectares.

Conifer Transplants

The transplants were done from August 12 to September 17 under cool cloudy weather and wet soil conditions. 720,000 conifers were transplanted this year at the rate of 35,000 per day.

Weeding

For the second consecutive year, the weeds have been under very good control with minimal weed seed being produced. Similar to last year, there was a late flush of weeds in the fall which were not cleaned up but the frost will prevent them going to seed.

Lifting and Grading

Lifting was completed October 30, with only an excess of acute leaf willow left in the field. The oversized caragana of field 30 caused equipment problems and slowed down the lifting operations. There is an ungraded surplus of 185,000 plants. The breakdown of graded material is as follows:

Tall Deciduous	684,500
Small Deciduous	158,150
Hedge Plants	1,324,550
Coniferous	56,170
Total	2,223,370 (plus 2,077 conservation bundles)

There is also a volume of 2,800 larger trees and shrubs set aside for the Forever A Tree bundles.

65% of this plant material is stored in the headerhouse cooler
 25% is held in field 27
 10% is stored in cooler 11

Grounds and Arboretum

3,500 annuals were received from the Fort Saskatchewan Jail greenhouses and planted in late May, early June. A late light frost and cool temperatures produced an initially poor display but they recovered and gave a good display in the latter part of the season.

Several species in the old arboretum were winter killed including three Salix alba vitellina, two Juglans cinerea, one Hippophae rhamnoides, one Thuja X 'Brandon' and one Populus alba. The three Salix spp. were replaced. The other species were not because of crowding in these areas.

Planting has continued in the new arboretum bringing the numbers up to 107 species representing 32 genera.

Plantings: October 23, fifteen species of selected material from Beaverlodge Nursery was planted in field 22 next to the Simonet collection.

Summary of Field Stock Performance 1985

Hardwood Cuttings: The soil temperature dropped 15°C to 10.5°C during the planting operation (9 days) and did not recover for three weeks. The cuttings were slow to sprout. The laurel leaf willow crop sprouted, then at month end, started to die off. The success rate of laurel leaf willow was a poor 14% while acute leaf willow was 73% (probably higher as not all were harvested). The poplar cuttings were a uniform looking crop but only had a success rate of 48%.

Seedbeds: The overall germination in the seedbeds was very good. Red elder and dogwood both germinate and grow sufficiently to be produced as good one year old crops. Roses, cherry prinsepia and chokecherry are causing problems with delayed or sporadic germination. After two years in the field, roses and chokecherry are basically being harvested as a one year old crop. The cherry prinsepia has uniformly been germinating in late August of year one, but not shipped until it is 3-0.

Honeysuckle, a non-stratified seed, has been yielding poor germination in the last years. Several different seeding methods were tried in the fall of 1985 to attempt to correct this problem.

Conifer Transplants: The spring thaw and refreeze caused heaving of the spruce transplanted in 1984. These were replanted in the early spring. The pine transplants, particularly lodgepole pine, were showing signs of severe chlorosis in field 24. The transplants of lodgepole pine planted out this year were showing chlorosis before they were planted out.

CONTAINER PROGRAM

Growing seedlings in small and large containers are the two phases of this program. The small container growing phase consists of growing plant material for other programs; the large container phase deals with growing native woody plants for the Provincial Parks. Small containers are mainly 37 and 160 cc containers, while large containers are 1, 2, 5 or 7 gallons in size.

A descriptive outline of these two phases of the container program is illustrated.

SMALL CONTAINER PROGRAM

In 1985, the small container program totalled 1,142,153 seedlings, grown over two crop periods. The following table shows the breakdown of production.

TABLE VI
SMALL CONTAINER PRODUCTION 1985

PROGRAM	DECIDUOUS SEEDLINGS	CONIFEROUS SEEDLINGS	% OF TOTAL PRODUCTION
Shelterbelt	39,168	747,600	69
Provincial Parks	84,127	31,162	10
Contract Growers	-	142,800	13
Arbor Day	-	39,600	3
Special Orders	57,696		5
Total	180,991	961,162	

The containers used to meet production requirements:

Ferdinand 37 cc	50%	These are both types of the
Hillson 160 cc	26%	Spencer Lemaire model
Others	24%	

Shipment of 226,703 seedlings were distributed to the following clients as illustrated in the following table.

CLIENTS	DECIDUOUS MATERIAL	CONIFEROUS MATERIAL
Contract Growers		75,400
Indian Affairs		87,700
Christmas Tree Sales		2,000
* P.R.S.F.G.	2,482	
Arbor Day		44,151
Miscellaneous	3,072	11,898
Total	5,554	221,149

* Peace River Small Fruit Growers

Seedlings overwintered during 1984-85 totalled 1,701,940. Table VII shows the breakdown.

TABLE VII
SUMMARY OF OVERWINTERED SEEDLINGS

CLIENTS	DECIDUOUS	CONIFEROUS	TOTAL AMOUNTS
Shelterbelt	113,243	1,216,688	1,329,931
Contracts		142,800	142,800
Indian Affairs		92,600	92,600
Special Orders	23,435	107,227	130,662
Miscellaneous	1,352	4,595	5,947
Total	138,030	1,563,910	1,701,940

A mortality of 9% or 161,157 seedlings was recorded in 1985, an increase of 7% from 1983-84.

The container section in 1985 comprised of three permanent and 23 seasonal/casual staff. Table VIII outlines mandays used for major job functions.

TABLE VIII
LABOUR REQUIREMENTS FOR THE SMALL CONTAINER PROGRAM

ACTIVITIES	CASUAL LABOUR	
	MANDAYS USED	%
Charts, watering and fertilizing crops, inventory, chemical application, paid absence	60	6
Filling and seeding containers	143	15
Thinning and weeding greenhouse crops	149	16
Unloading and loading greenhouse crops	53	6
Weeding and dudding lathhouse crops	214	23
Maintenance greenhouses, lathhouses and working complexes	110	12
Pickup, ship and assemble trays	145	15
Trial work and miscellaneous	67	7
Miscellaneous	62	8
Total	941	100

PROVINCIAL PARKS PROGRAM (Large Container Program)

A total of 14,104 potted native trees and shrubs were shipped to the following parks in 1, 2, and 5 gallon pots as illustrated in Table IX.

TABLE IX
DISTRIBUTION OF MATERIAL PRODUCED FOR
PROVINCIAL PARKS

	NUMBER OF POTTED DECIDUOUS	NUMBER OF POTTED CONIFEROUS
<u>Project Management</u>		
Big Knife	200	
Blackfoot	1,400	600
Lundbreck Falls	280	170
Saskatoon	773	289
Whitney Lakes	197	35
<u>Southern Region</u>		
Chain Lakes	25	
Cypress Hills	600	650
Kinbrook	385	
Little Bow	135	
Park Lake	200	
Taber	200	
Tilliebrook	20	
Writing-on-Stone	120	
<u>East Central Region</u>		
Dillbury		20
Gregoire Lake	1,650	
Miquillon Lake	1,646	
Sir Winston Churchill	2,012	
<u>North Region</u>		
High Prairie	800	
Hilliard's Bay	382	40
Young's Point	400	
<u>West Central Region</u>		
Rimby	200	100
Kananaskis Country	460	115
Total	12,085	2,019

Deciduous species consist of: balsam poplar, willows - laurel leaf, acute , native, sandbar and mixed, pincherry, dogwood and prickly rose.

Coniferous species consist of: white spruce, siberian larch, creeping and ground junipers.

Propagation of plants for the purpose of filling large containers was as follows:

PROPAGATION	DECIDUOUS	CONIFEROUS
Seeded in containers	94,496 cavities	28,800 cavities
Cuttings in containers	8,256 cavities	
Cuttings in mist beds	<u>6,078</u> cavities	<u>8,000</u> cavities
	108,830	36,800

Potting and repotting of container stock in 1985 totalled 67,607. Seedlings were transplanted into 4 inch, 1, 2, and 5 gallon pots and grow bags.

POTS	DECIDUOUS	CONIFEROUS
4" pot	2,115	2,504
1 gallon pot	27,304	2,362
2 gallon pot	24,949	685
18" grow bag**	7,500	
5 gallon pot	<u>188</u>	<u> </u>
	62,056	5,551

** The 18" grow bag is a new system used this year. Potted trembling aspen were placed in these bags in the field. The sidewalls of the bag is made of a non-woven fabric with a tough clear poly-bottom, allowing for swelling of the roots inside the bag.

Mandays used for major job functions of the Provincial Parks program is outlined in Table X.

TABLE X

LABOUR REQUIREMENTS FOR THE PROVINCIAL PARKS PROGRAM

ACTIVITIES	NUMBER OF MANDAYS	%
Shipping	85	5
Weeding and dudding pots, irrigation, moving pots	634	42
Seeding, transplanting & repotting	710	47
Maintenance	92	6
Total	1,521	100

TABLE X1

INVENTORY OF STOCK IN LARGE CONTAINERS 1985-86
FOR THE PROVINCIAL PARKS PROGRAM

SPECIES	POTTED	MORTALITY	NEWLY	SHIPPED	POTTED	SHIPPABLE	SMALL
	PLANTS		STARTED		PLANTS		CONTAINER
	ON HAND		POTTEL		STOCK		STOCK
FALL '84	84-85 POTS	1985	1985	FALL '85	1986	ON HAND	
FOR 1986							
<u>Deciduous Large Trees</u>							
Plains Cottonwood	3,554	757	385		3,182	980	3,840
Green Ash	3,083	1,331	2,520		4,272		1,152
White Birch	6,745	804			5,941	1,120	1,536
Aspen	9,829	583			1,844		1,112
In Grow Bags					7,402		
Cottonwood	1,154	422	1,742		2,474	700	2,880
Narrowleaf Cottonwood	504	110	161		555	140	
Balsam Poplar	5,768	1,281	3,389	1,975	5,901	1,200	1,536
Mixed Poplar & Northwest	445	27	91		509	200	
<u>Coniferous Large Trees</u>							
White Spruce	16,356	508		1,332	14,516	2,800	7,200
Lodgepole Pine	3,055	2,348			707		16,800
*Siberian Larch	5,993	1,022		misc 1,366 200	3,405		
*Scots Pine	936	428			508		
Jack Pine	3,876	2,207			1,669	100	8,400
<u>Shrubs</u>							
*Laurel Leaf Willow	4,103	2,232		misc 1,406 250	215		
Acute Leaf Willow	564	453	5,004		5,115	300	
Peach Leaf Willow			1,356		1,356	300	
Sandbar Willow	662	262	2,465	400	2,465	300	
Native Willow	2,133	428	3,174	713	4,166	600	
Mixed Willow	3,241	1,026		640	1,575	600	
Chokecherry	2,048	734			1,314		9,272
Pincherry	4,714	1,080	444	331	3,747	500	69
Wolf Willow	407	116	2,372		2,663	560	
Dogwood	33,061	715		5,706	26,640	7,700	9,216
Silver Buffaloberry	52	50			2		4,608
Snowberry	77	42	129		164		
Cinquefoil	183	58	411		536	100	960
Bracted Honeysuckle	8	8					2,780
Prickly Rose	6,116	1,261	4 147	1,850	7,152	2,000	
Wild Rose	14,450	798	2,204		15,856	3,500	5,824
Creeping Juniper	2,513	439		205	1,869	260	
Ground Juniper	4,415	1,866	2,369	502	4,416	1,170	612
Highbush Cranberry	652	353			299		5,584
Lowbush Cranberry							2,976
Saskatoon	2,059	962			1,097	600	7,504
Gooseberry	449	25			424	325	704
Hazelnut							230
Clematis							2
Bearberry	139	139	1,879		1,879		
Labrador Tea			107		107		
(*Discontinued)	143,344	24,875	34,349	14,104	135,942	26,055	94,797

18%

(Misc 4,772) (Grow Bag)
(7,449)

CHEMICAL STORAGE BUILDING

In 1985, the chemical storage building continued to service the five areas designated as fertilizers, chemical storage, soils branch, vertebrate pest and general storage.

The lighting system in the vertebrate pest area was vastly improved with installation of fluorescent lighting. This became possible following the de-regulation of the room from an anti-explosion status.

A 24-hour burglar alarm system became functional early in the year throughout the building. Although it encountered some equipment problems, they are now ironed out and the system works very effectively.

An addition to the warehouse began in December. This will accommodate additional space jointly required by the soils branch and weed control section, i.e., lab space, dryers, etc.

SEED LABORATORY AND EXTRACTION PLANT

SEED LABORATORY

The fruit and cones of 36 species of deciduous and coniferous trees and shrubs were harvested this year to satisfy the increased field and container seeding program at the Alberta Tree Nursery and Horticulture Centre. The material was collected from sources on and off this site.

The processed seed was then cleaned and stored to ensure an adequate supply of high quality seed with potential for prairie planting. The heavy seed crops this season were from white spruce, colorado spruce, Ohio buckeye, chokecherry, sea buckthorn and cherry prinsepia. Siberian larch, Mongolian cherry, Koren bush cherry and honeysuckle had very poor seed crops.

Throughout the year, 39.3 kilograms of four seed species was distributed to commercial nurseries and individual growers for contract growing.

The 1985 annual seed collection and the thirteen year (1973-1985) summary of seed collection are found in Table XII and Table XIII.

The seed inventory in cold storage at the end of the year was over 1,750 kilograms.

SEED STORAGE ANNUAL INVENTORY - DECEMBER 1985

1. Shelterbelt Program	1,303 kg
2. Provincial Parks	62 kg
3. Reclamation Branch	66 kg
4. Private Companies	324 kg
5. Miscellaneous	22 kg
Total	1,777 kg

TABLE XII

1985 ANNUAL SEED COLLECTION

SPECIES	DATE OF HARVEST	AMOUNT OF FRUIT/CONES PICKED (KG)	YIELD OF CLEAN SEED (KG)
Tall Deciduous	21.05 - 18.10.85	356	188
Small Deciduous	15.07 - 11.10.85	1109	178
Hedge Plants	19.07 - 18.10.85	1041	124
Coniferous Trees	27.08 - 23.10.85	2272	42
Total		4778	532

TABLE XIII

SEED COLLECTION SUMMARY: 1973 - 1985

YEAR	AMOUNT OF COLLECTED FRUIT/CONES (KG)		YIELD OF CLEAN SEED (KG)	
	DECIDUOUS	CONIFEROUS	DECIDUOUS	CONIFEROUS
1973	474	103	54.14	1.40
1974	2,005	1,635	22.39	37.60
1975	682	1,808	55.40	49.05
1976	662	131	188.38	23.98
1977	868	98	203.92	12.78
1978	995	193	257.33	63.50
1979	718	4,091	102.66	69.51
1980	1,573	212	358.00	9.00
1981	1,594	1,835	518.64	9.80
1982	1,596	5,145	175.00	55.00
1983	4,108	1,422	519.00	18.00
1984	2,547	672	354.00	9.00
1985	2,506	2,272	490.00	42.09

CHEMICAL SECTION

As a whole, the spraying section had a successful year in the control of weeds. A few problem areas had developed making these areas priority. Problem sections were dandelions in the grass areas and especially a problem in the seedbeds. The Canada thistle was a problem amongst the seed orchard and in many particular spots around the Nursery. The Nursery worked on a zero tillage program this year so a lot of spraying was done on the summer fallow fields.

One new chemical was used this year, namely Premium 3-way, which is a 2-4,D herbicide used in the same manner as Killlex.

AMOUNT OF CHEMICAL APPLIED

CHEMICAL	VOLUME IN LITRES OR KG
Linuron	166.0 litres
Tenoran	277.75 kg
Killlex	278.0 litres
Round-up	529.0 litres
Gramoxone	10.0 litres
Banvel	10.0 litres
Casoron	270.0 kg
Basamid	1200.0 kg
Treflan	1.5 litres
2-4,D Ester	3.0 litres
Foligard	240.0 litres
Malathion	7.38 litres
Dimethoate	676.5 litres
Diazinon	10.0 litres
Esso 350	454.0 litres
Skoot	9.0 litres

FARM SERVICES

Within Farm Services, there is maintenance and repairs, field irrigation, general cultivation, field preparation, equipment control and supply and shelterbelt weed control.

There were a total of 25 summer staff hired to assist permanent staff in 1985.

MONTH	NUMBER OF WORKDAYS
April	105
May	365.97
June	378.1
July	444.41
August	362.31
September	229.78
October	172
November	84

Fertilizer Application

Fertilizer was applied in May, July and October.

FERTILIZER	TOTAL AMOUNT	AREA FERTILIZED
11-51- 0	6180 kg	35.62 ha
34- 0- 0	100 kg	1.09 ha
46- 0- 0	2605 kg	19.81 ha
0- 0-60	234 kg	2.34 ha
21-0- 0	487 kg	4.20 ha

Gravel

In October/November, 350 cu metres of 3/4" crush was spread on various roads throughout the nursery to improve field access.

Cultivation

Zero cultivation was done throughout the season. In spring and fall, all areas were cultivated to breakup soil for moisture penetration. Other cultivation was done to prepare fields for planting and seeding.

Snow Removal

Snow removal has been minimal. All paved areas have been kept clear and left in piles. When piles became too large, they were hauled to field 2 which has good drainage.

Site Improvements

There were several culverts installed for field access, irrigation crossing roads and to improve drainage of water. The parking area across from field 27 is half done and covered with pine and spruce cones. Fill from the new lathhouse was hauled to fields 22 and 38 slough areas. Field 22 also had willow removed around sloughs. When completed, it will increase production area and drainage.

Whip Cuttings

Whips were cut and hauled in as required. The new side mount mower is working very well. This mower is mounted on the 5600 Ford tractor.

Pruning and Shelterbelt Removal

Pruned out dead and damaged material from various shelterbelts. Removed windbreak in field 16. East of field 27e, we removed a bluff for future parking area for summer staff. The office area had several trees cut down and removed. Removed several trees along creek and dead lilac along roadway by field 25a. The maple between fields 28 and 29 were removed, also field 17 and 21 had dead trees and limbs removed.

Grass Mowing

All field grass areas were kept under control this season. Heavy areas were swept.

Fencing

Several areas were fenced and gates installed for access.

Oats

Oats were seeded as a green manure crop in May 1985 as follows:

TYPE	AMOUNT KG	AMOUNT HA
Grizzley Oats	676.65 kg	10.41 ha

Grass

Crested wheat grass was seeded on damaged grass areas as well as non-production areas for weed control as follows in 1985:

TYPE	AMOUNT KG	AMOUNT HA
Crested wheat grass	165 kg	2.36 ha

Peat Moss

2000 kg of peat moss was delivered in November and spread on fields and worked in as follows in 1985:

FIELD #	AMOUNT SPREAD
12a	400 meters
12b	400 meters
35d	400 meters
Stock Pile	800 meters

Caragana

Caragana was seeded in field 30 in 1985 as follows:

RATE	SEED KG	AMOUNT SEEDED
90 seeds per metre	94	3.30 ha

Tree Poachers

We lost two spruce trees before we started the Christmas tree patrol. Three more spruce were lost after patrol started but the patrol chased them away before they had a chance to load them. One trespasser was given a warning.

Equipment Maintenance

Regular maintenance was carried out on approximately 20 vehicles, 26 large and small tractors, 7 lawn mowers and 100 miscellaneous pieces of equipment.

Irrigation

General: Very wet spring with no watering needed in April. Good growing conditions with all cuttings and transplants starting out well. There was a slow down of growth and even some kill back of stock during the summer. The cause was not water related.

Pipe Damage: Above ground lines; six 6 inch, two 4 inch, and twelve 2 inch. Underground lines; 30 risers repaired and 25 sprinklers damaged.

Pumps: All pumps working well with only minor adjustments needed during the summer.

Main Line Changes: The line to field 32 was re-routed to the new area in field 38 from field 28 and then down the creek bed to the field 32 area. The line crosses under the Fort Road by field 28 and uses less pipe than from Moran's. This was a big improvement over previous years.

Early Watering: Watering early (before weeding, transplanting and cutting crews start and before the sun causes evaporation losses), was again used with great success.

NURSERY TRIAL REPORTS

During the 1985 season, five woody plant trials were either in progress or started.

Investigation #28B - 1985

Container Stock Media Trial: This investigation has been in progress since 1982 and the final year of observation was 1985. In this trial, the effects of adding nutrients to the growing medium of containerized plants was studied. The nutrients consists of bone meal, super phosphate, dolomite lime, calcium carbonate, potassium sulphate and potassium nitrate.

During the first growing season, the soil enrichment was beneficial for most of the species used. However, this trend disappeared during the following two years. The trial was also greatly hampered in evaluation because of high mortality rates during the overwintering period and rodent damage during the winter.

Investigation #41 - 1985

Comparative Growth of Container Grown Plants Versus Bareroot Grown Plants: 1985 was the third growing season of this five year trial (jointly carried out at the Alberta Tree Nursery and Horticulture Centre and at the Alberta Horticultural Research Center). The 1985 observations are as follows:

1. During the 1985 year of the trial, only two plants died at the Alberta Tree Nursery and Horticulture Centre site, while in 1984, eight plants were recorded as dead.
2. After three years of planting out the two types of plants at the Alberta Tree Nursery, only the northwest poplar plants from container origin shows a significant greater stem diameter and height increase than the plants from bareroot origin. The measurements taken from the siberian larch can hardly be considered to be of value since six of the 15 plants died. With chokecherry, there is evidence that barerooted plants perform better in height development than plants from container origin.

The plant material at the Alberta Horticultural Research Center tends to show that the barerooted plants do much better on average.

This trial will be continued at both locations for an additional two years.

Investigation #42 - 1985

Overwintering of Large Container Stock: This trial, initiated in the fall of 1982, was monitored for three years and is now completed. The purpose of the trial was "to determine the most successful overwintering condition of seven storage methods for ten woody plant species, growing in one gallon containers".

In conclusion, this trial clearly demonstrates that winter protection of containers by mulching or covering is essential for survival of the native plants used in the trial. Although the use of mulching pots is labor intensive, the end results are justifying the effort.

Use of microblankets and laying down the plants is the least labor intensive overwintering improvement. This system should be applied for all of the more sensitive species.

Investigation #45 - 1985

Testing of the Herbicide "Goal" for Weed Control in Spruce and Pine Transplants: This trial is now concluded with the following results:

1. Crop Tolerance: From the combined observations of 1984 and 1985, it seems evident that both lodgepole pine and colorado spruce are not affected by one application of oxyfluorfen (Goal) at rates of up to 1.5 kg/ha. Also the height increase of the two coniferous species over a period of two years is not adversely affected.
2. Control of Weeds: Application of oxyfluorfen at a rate of 1.0 kg/ha significantly reduces the occurrence of a wide spectrum of weeds. There seems to be clear evidence that hard to control weeds such as dandelion, common groundsel and clover are severely suppressed by "goal".

Investigation #47

Trial Work with Seed, Seeding Density Trial: The purpose of this trial is to determine the optimum rate of seeding to achieve the optimum stocking density of seedlings. General practice at the Nursery is to construct a raised seedbed in which five rows of seed are established. Rows are 23 cm apart in the seedbeds. It is assumed that ideal stocking and harvesting will produce 125 seedlings per meter of bed or 25 mature seedlings (2-0) per one meter of single seeded row. Since the stocking of mature 2-0 seedbeds varies greatly and since most attained stockings are well below the ideal number of 125, this trial is an attempt to determine more closely the required rate of seeding in order to produce ideally stocked seedbeds.

This trial started in the fall of 1983. The final recordings will be available from the 1986 readings of stocking of the 12 woody plants under investigation.

Investigation #51

Wound Healing Trial: Started in the 1985/86 winter, the bark of mature deciduous tree stems were wounded. In following years, the ability of the tree to cover-up these wounds with new growth will be monitored.

REGIONAL WOODY PLANT TEST PROGRAM

Up to 32 species were added to the trial in 1985. That is, more than 145 plants were planted at each of the test sites. A total of 78 species have now been established at each site. Four species were sent out prematurely. These four were received from the supplier in very late fall, overwintered in the bulk storage and included in the shipping.

Much of the stock purchased and received for the trial came in very poor condition. The material was extremely dry with extensive limb breakage. These complaints were passed on to the supplier. However, a few of the worst plants were shipped, many more were kept here with considerable loss.

There is concern over the lack of care the plants receive on at least two of the sites. This will be handled internally.

Trends

1. The Initial dieback from transplant shock was overtaken by new growth this spring on most species. Few plants continued dieback and those are noted. The problem of transportation breakage experienced in 1984 was considerably reduced in 1985.
2. Misnaming continues to be a problem but less so than previously encountered.
3. The transplanting performance of many species is becoming a serious concern and may prove to be more of a problem than the actual "hardiness" of the plant. Besides the 'Tower' poplar, Tilia 'Dropmore' and 'Fallgold' ash, species such as Ohio buckeye, the maples, white poplar, white willow, golden elder and 'Royalty' lilac, may need special transplanting techniques or at least more care when transplanting.
4. It is clearly evident that success of most conifers in southern Alberta is dependent upon the care and shelter the plants have.
5. It is becoming evident that 'Northern Gold', Forsythia and 'Patmore' ash have few limitations in Alberta.
6. A large number of new plants will again be planted in 1986. Also, a large number of replacements and plants added to the sheltered locations will be planted.
7. No headway was made in attracting sites at Medicine Hat or Ft. McMurray unfortunately. These two sites would make the study more complete.

PUBLICATIONS

Grainger, George. Transplanting Alberta Trees and Shrubs. Revised. Agdex 275/22-1/

Mohyuddin, Dr. Mirza. Greenhouse Cucumber Production Guide. Agdex 256/15-1. 1985.

Mohyuddin, Dr. Mirza. Poinsettia Production. AGGA publication, July, 1985.

Oosterhuis, Herman. Shelterbelt Planting and Farmstead Beautification. Revised. 1985.

Oosterhuis, Herman. Establishing Trees in the Urban Landscape. 1985. (A Trees In the Urban Landscape Committee publication.)

Vladicka, Betty. Vegetables Without a Garden. Prairie Gardener. 1984.

Trial Reports

Alberta Tree Nursery and Horticulture series:

Seed Trials, 1985

Field Investigations, 1985

Co-operative College and University Vegetable Cultivar Trials, 1985

Vegetable Cultural and Cultivar Trials, 1985

Newsletters

Produce Notes - Editor: Phil Dixon

Nursery Notes - Editor: Betty Vladicka

Alberta Greenhouse Notes - Editor: Mirza Mohyuddin

Alberta Horticulturist - Editor: Betty Vladicka

Hort Happenings - Editor: Betty Vladicka

Horticulture Extension Notes - Editors: Lorraine Taylor/
Leonard Eckberg

Talks Given

Date	Topic	Place
<u>Phil Dixon</u>		
January	Market Garden Short Course	Edmonton (60 participants)
February	Market Garden Short Course	Bonnyville (20 participants)
July	Stony Plain Growers Tour	Stony Plain
July 15	Growers Barbecue	Edmonton (74 participants)

Date	Topic	Place
July	"Promotion" - Farmers Market	Stony Plain (20 participants)
August 6	Edmonton Growers Tour	Edmonton (85 participants)
August 7	Wholesale Tour	Edmonton (4 companies)
November 4	"Market Information Night"	Edmonton (25 participants)
November 28	"Co-op Marketing"	Lethbridge - Alberta Fresh Vegetable Marketing Board
<u>Dr. Mirza Mohyuddin</u>		
February 18-22	Crop Cultivars and Disease Control in Hydroponics	International Centre for Special Studies Honolulu, Hawaii
March 5	Greenhouse Media Management	AGGA workshop, Red Deer
March 18	Greenhouse Industry in Alberta	University of Alberta Plant Science Dept.
March 23	Water Quality in Plant Production	Sangudo Horticultural Society, Sangudo
March 26	Tomatoes and Lettuce Production	University of Alberta Plant Science Dept.
April 12	Growing Bedding Plants	AGGA workshop, Bonnyville
April 24	Greenhouse Fertilizers	AGGA workshop, Edmonton
June 25	Pesticides and Greenhouse	AGGA workshop, Medicine Hat
July 18	Growing Poinsettias	AGGA workshop, Edmonton
July 29-31	Greenhouse Problems in 1985	Hort Week, Olds College
October 2	Managing Fertilizers in Interiorscapes	Interior Landscape Assoc. workshop, Edmonton
October 21-23	Nutrient Management	AGGA 3rd Annual Convention, Calgary
November 2	Alberta Greenhouse Industry	Canadian Greenhouse Conference, Guelph
November 6-8	Bedding Plants Production, Geranium Production and Growth Regulators	Saskatchewan Greenhouse Grower's Association
<u>Herman Oosterhuis</u>		
March 21	Shelterbelts	Fairview
March 26	Pruning	High Prairie
April 1	Shelterbelt Maintenance	Sherwood Park
April 9-10	Pruning	Grande Prairie
April 11	Woody Plants	Spirit River
April 18	Landscaping	Vegreville

Date	Topic	Place
July 22	Landscaping	Rockyford
November 21	Shelterbelts	Medicine Hat
December 5	Nursery Workshop	Red Deer
<u>Lorraine Taylor</u>		
February	Vegetable Gardening	Barrhead
February	Home Lawn Care	Muttart Conservatory, Edmonton
March	Keeping Your Yard Looking Its Best	Fairview
March	Vegetable Gardening	Spirit River
March	Vegetable Gardening	Athabasca
March	Vegetable Gardening	Elnora
March	Turf Insects & Diseases, Pesticide Applicators Course	Olds College, Olds
April	Home Lawn Care	Edmonton Horticultural Society, Edmonton
<u>Betty Vladicka</u>		
January	The Care of Indoor Plants	Lethbridge Horticultural Society, Lethbridge
January	Landscaping Your Yard	Debolt
February	Keeping Your Yard Looking Its Best	Andrew
March	Landscaping Your Yard	Sherwood Park
March	Vegetable Gardening	Camrose
March	Vegetable Gardening	Sedgewick
March	Extending the Season in Your Vegetable Garden	Spruce Grove
April	Keeping Your Yard Looking	Wetaskiwin
June	Repairing the Ravages of Winter	Edmonton
July	Storage of Garden Vegetables	Athabasca
August	Ways to Propagate Indoor Plants	AHRC, Brooks Field Day
November	Growing Vegetable Crops in the Greenhouse	Rural Women's Conference, Wildwood